

KNOWLEDGE AND PRACTICE OF INJECTION SAFETY AMONG NURSES AT UNIVERSITY OF CALABAR TEACHING HOSPITAL (UCTH), CALABAR, NIGERIA: IMPLICATIONS FOR NURSING EDUCATION

REGINA E. ELLA, EASTER C. OSUCHUKWU, PAULINA A. AKPAN-IDIOK AND STELLA E. KANU

(Received 10 June 2016; Revision Accepted 23 June 2016)

ABSTRACT

Exposure to blood borne viruses, by health care workers has been on the increase with nurses mostly affected. These exposures constitute serious challenges in the health care setting as they are common causes of illness and mortality among health care workers including hospitalized patients. Practice of standard precautions has been shown to reduce the risk of exposure to blood and body fluids. Over the years, injection safety has become an integral part of infection control in view of many diseases that are transmitted through unsafe injection practices. This study was conducted to assess the knowledge and practice of injection safety among nurses in UCTH, Calabar using a descriptive research design. The specific objectives were to assess the level of knowledge of nurses about injection safety, assess injection safety practices and ascertain the barriers to injection safety practices among nurses in UCTH. Purposive sampling was used to select one hundred and ninety one (191) nurses across the wards in UCTH Calabar. A checklist containing 37 items was used to elicit information. Frequency and percentages were used for descriptive data while the hypothesis was tested using Chi square (X^2) analysis at 0.05 level of significance. Result revealed that 59.7% of the respondents had good knowledge of injection safety and 66.0% had good practice of injection safety while 6.8% had poor practice. Barriers to injection safety practices included inadequate supply of injection safety material, none display of injection safety guidelines. Statistical analysis revealed a significant relationship between level of knowledge and practice of injection safety among nurses ($P = 112.8 < 0.05$). Recommendations: health care administrators and nurse leaders should display injection safety guidelines, supply injection safety materials and ensure that more nurses are recruited into the workforce.

KEYWORDS: Injection Safety, Nurses, Knowledge and practice.

INTRODUCTION

Exposure to blood borne viruses, by healthcare workers is on the increase with nurses being the most affected (Yang, Wu, Wang, 2013, Riaz, Kamal, Riaz, Aziz, Rajper and Noorulain 2012). These viruses include hepatitis B virus (HBV), hepatitis C virus (HCV), and human immunodeficiency virus (HIV) etc. These exposures are reported to constitute serious problem in the health care setting as they are common causes of illness and mortality among health care workers in general including hospitalized patients. Practice of standard precautions has been shown to reduce the risk of exposure to blood and body fluids.

One of the continuous routes of these exposures is from percutaneous (needle stick or other sharps) injuries. It is estimated that 50% of nurses will experience at least one needle stick injury in their

careers (Rhode, Dupler, Posta, Sanders, 2013). The World Health Organization estimated that, unsafe injection practices resulted in 501,000 deaths worldwide in the year 2010. Omorogbe, Omuemu, and Isara (2012) documented that the burden of unsafe injection practices is borne by health care providers especially nurses and doctors, the patients and the community at large. Also the global burden of diseases due to unsafe injection use, estimated by the World Health Organization (WHO) by probability model for the year 2008 was 340,000 Human Immunodeficiency Virus (HIV) infections, 15 million Hepatitis B Virus (HBV) infections, 1 million Hepatitis C Virus (HCV) infections, 3 million bacterial infections and 850,000 injection site infections. This accounted for 14% of HIV, 25% HBV, 8% HCV and 5% of bacterial infections worldwide (Sudesh, Devendra, Bhuvan and Ravi 2013).

To reduce these hospital administrators and

Regina E. Ella, Department of Nursing Sciences, Faculty of Allied Medical Sciences, College of Medicine, University of Calabar. Calabar, Nigeria.

Easter C. Osuchukwu, Department of Nursing Sciences, Faculty of Allied Medical Sciences, College of Medicine, University of Calabar. Calabar, Nigeria.

Paulina A. Akpan-Idiok, Department of Nursing Sciences, Faculty of Allied Medical Sciences, College of Medicine, University of Calabar. Calabar, Nigeria.

Stella E. Kanu, Department of Nursing Sciences, Faculty of Allied Medical Sciences, College of Medicine, University of Calabar. Calabar, Nigeria.

nurses have the responsibility of creating and maintaining a safe environment through practice of standard precautions in the care of patients, and in carrying out procedures, through adherence to standard precautions that has been shown to reduce the risk of exposure to needle sticks, blood and body fluids, (Chan et al 2002). The level of practice of these precautions by HCWs may differ from one type of HCW to another probably due to the differences in knowledge. The differences in knowledge may be influenced by their varying type of training, the absence of enabling environment in the health institution.. It therefore, becomes important to assess the level of knowledge and practice of universal precautions by trained nurses, who make direct contact with patients.

The University of Calabar Teaching Hospital (UCTH) plays an integral role in health care provision and serves as a referral centre for the entire state. Thus nurses working there are exposed to a lot of sharps and therefore exposed to high risk of blood borne infectious diseases as they carry out their primary responsibilities to patients. Despite the numerous researches carried out nationally concerning injection safety practices and a few of such in UCTH, reports of needle stick still abound from different units and wards from nurses and doctors in UCTH with nurses ranking highest (between 2012-2015) notwithstanding the provision of guide lines of universal precautions as provided by the World Health Organization. This fact justifies the need for further investigations into the knowledge and practice of injection safety to allow for more efficient measures for intervention based on knowledge of local reality. This study is aimed at assessing the knowledge and practice of injection safety among nurses at University of Calabar Teaching Hospital (UCTH), Calabar, Cross River State, Nigeria

Purpose of Study

The purpose of this study was to assess the knowledge and practice of injection safety among nurses at University of Calabar Teaching Hospital (UCTH), Calabar Cross River State.

Specifically the study sought to:

- Assess nurses' level of knowledge about injection safety at University of Calabar Teaching Hospital (UCTH), Calabar, Cross River State.
- Assess injection safety practices among nurses at University of Calabar Teaching Hospital (UCTH), Calabar Cross River State.
- Ascertain the barriers to injection safety practices among nurses at University of Calabar Teaching Hospital (UCTH), Calabar, Cross River State.

Research Hypothesis

There is no significant relationship between knowledge and practice of injection safety among nurses at University of Calabar Teaching Hospital (UCTH), Calabar.

Significance of the study:

- Recommendations from the study if implemented will improve the level of knowledge, practices of injection safety and adherence by health workers to precautionary measures.
- Educationally, findings will aid nurses and midwives to create awareness on the dangers of poor practices such as needle stick injuries, transmission of HIV, hepatitis Band C and other blood borne infections.
- Policy makers and hospital administrators through the findings will promote and reinforce injection safety guidelines, create enabling environment and provide adequate resources for nurses and other health care workers to carry out injection safety practices.
- The study will also provide a baseline for future researchers in relevant topic.

1. LITERATURE REVIEW

Unsafe injection practices not only harm the health care workers (HCWs) but patients as well. A safe injection is one that, is given using appropriate equipment, does not harm the recipient (patient), does not expose the provider (HCWs) to any avoidable risk and does not result in waste that is dangerous for the community (WHO 2002, WHO 2008, WHO 2011). Therefore, safe injection practice involves administration of rational injection by a qualified and well trained person using a sterile device (syringe, needle etc), adopting sterile technique, and discarding the used devices in a puncture-proof specially designed container for appropriate disposal. Furthermore the process of injection safety practices include; reduction of injections, ensuring safe injection practices by applying the 'nine rights', of appropriate injection devices and proper disposal of sharps and other healthcare wastes. . The 'nine rights' of injection safety ensures that the right patient is given the right drug in the right dosage and right formulation using the right injection and equipment at the right time and right route with right storage and the right method of disposal.

Any breach in the processes makes the injections extremely unsafe and hazardous to HCWs (provider) and patients as well. In order to achieve safe injection practice, Government of Nigeria has taken the responsibility to deliver health care services by mobilizing qualified health personnel, ensuring availability of sufficient quantity of sterile devices.

1.1. Nurses level of knowledge about injection safety

Onyemoch, Joshua and Enokela (2013) carried out a study on level of knowledge among nurses and doctors about injection safety in Nigerian Prison service health facilities in Kaduna State, findings showed that 54.3% of nurses and doctors had good knowledge score of key injection safety issues, while 16.7% and 29.0% had fair and poor knowledge scores

respectively. Similarly, Adejumo and Dada (2013), conducted a comparative study on knowledge, attitude and practice of injection safety among nurses in two hospitals in Ibadan, Nigeria, using 385 nurses, findings revealed that their knowledge level was high; 100% all had heard about injection safety, 70.4% had knowledge associated to un-safe injection with blood borne infection, 55.9% had information that recapping with both hands was not a safe injection practice, 84.4% claimed that contaminated sharps predisposed the community to bio-hazards and 76.1% had information that used syringes and needles should be discarded in a sharp waste box. However, they reported that the high knowledge did not translate to practice as about half of the participants (50.4%) were seen to have sustained needle stick injury through intra-muscular and subcutaneous injections.

On the contrary, the study by Omorogbe, Omuemu and Isara (2012) on injection safety practices among nursing staff of mission hospitals in Benin City, Nigeria, revealed that knowledge of injection safety was poor among nurses in mission hospitals in Benin City but their practice of injection safety was encouraging. Regular training workshops on injection safety to improve the knowledge and practice of nurses were recommended.

2.2. Safe injection practices among Nurses

Paul, Roy, Chattopadhyay, Biosoi, Misra, Bhattacharya and Biswa (2011) study on safe injection practices among nursing personnel in a tertiary hospital of Kolkata, West Bengal, India, reported that out of 80 nurses used for the study, 12.5% of the respondents washed their hands with soap and water before administering injection. 60% of them maintained correct procedure (WHO recommended) while giving injection, whereas sterile gloves were used by only 3.7%. Hub cutters were used in disposing of needles in 57.5% of all procedures carried out during the study; needles were recapped in 42.5% of all procedures while used syringes were disposed off correctly in 41.2% of all procedures. The authors concluded that there was need to continuously educate, train and motivate service providers especially nurses in proper method of handling injection equipments, and that a local policy and surveillance program based on the WHO guidelines might be helpful in this situation.

Enwere and Diwe (2014) in assessing the perception and practice of injection safety and health care waste management among healthcare workers in South East Nigeria used 156 respondents, of which 84 were nurses. The result showed that 84 (67.2%) of the respondents had previously had a form of training on it. Only 81 (54%) had heard or seen colour coded bins. Few of the health workers (45%) still recapped needles after use. Half (50%) of the respondents have had previous needle prick injury. Only 25.6% with previous needle prick injury had post exposure prophylaxis. All doctors and laboratory scientists always used gloves as compared to 94.8% of nurses who did not while handling patients or materials. They concluded that there was need for health care workers particularly nurses to be regularly updated on injection safety standards in their practice. Also, health workers must be encouraged to

acquire and use internationally accepted standard materials in collection and disposal of patient's samples.

However, Sudesh, Devendra, Bhuvan and Shankar (2013) reported that nurses working in Primary Health Care in Baglung district, Western Nepal maintained injection safety practices such as the use of auto-disable syringes to inject curative drugs. Sufficient safety boxes were also supplied to dispose the used syringes. Almost all the nurses had received full course of Hepatitis B vaccine and were knowledgeable about pathogens transmitted through unsafe injection practices

2.3. Barriers to the practice of Injection Safety

In assessing injection safety practices among nurses in a main referral hospital in North eastern Nigeria, Gadzama, Bawa, Ajinoma, Saidu and Umar (2014) concluded that safe injection practices were generally adhered to by nurses and other health workers. However, their study revealed some gaps and challenges in some units/wards such as non-availability of good disposable injection equipment separately for sharp and non-sharp infectious waste, lack of regular running water and soap for cleansing of hands, non-adherence to universal precautions that would have reduced the likelihood of contamination of injection materials by few staff members. Moreover, there were units that did not provide support and counselling services for staff that reported sharp injuries, and that there was poor utilization of hepatitis B vaccine among service providers. Hence, there was a need for an investment in sustained continuing training of nurses and other health care workers and in making available logistics and support supervision to ensure that health workers adhere to standard guidelines and practices.

Stating the reasons for the neglect to carry out injection safety practices among nurses Onyemcho et al, (2013) listed them to include working under the pressure, overwhelming social, economic and political challenges, which puts the patients and healthcare providers at risk of infectious and non-infectious adverse events. Similarly, Okwen, Ngen, Alomba, Capo, Reid and Ewang, (2011) study revealed that non-availability of needles and syringes at the time of use, pressure at work, lack of display of injection safety guidelines in the hospitals were associated with non-compliance with injection safety practices. Furthermore they observed that the unacceptable standards of injection safety practices in the Northwest Province of Cameroon was associated with poor knowledge which was due to the inadequate training of nurses and other healthcare workers. The study further revealed that injection equipment reuse occurs commonly in the Northwest Province of Cameroon, practiced by 44% of health workers at public hospitals. Sudesh, Devendra, Bhuvan and Shankar, (2013) saw the above issues as pointers to lack of management policy and waste disposal guidelines for the facilities and as major barriers to the practice of injection safety major. Okwen et al that injection safety intervention could prevent estimated 14-336 HIV infections, 248-661 HBV infections and 7-114 HCV infections each year in these health districts and auto-disable syringes may be an appropriate solution to injection safety problems in some hospitals in Cameroon.

MATERIALS AND METHODS

Research Design

Survey Design was adopted for this study

Research settings

The setting for the study was Cross River State, which is one of the 36 states of the Federal Republic of Nigeria and it has eighteen (18) Local Government

Areas (LGAs). The study site was University of Calabar Teaching Hospital established in 1979 and is a tertiary health facility. It has adequate resources for training of nurses and doctors including other health care workers and accepts referrals from primary and secondary health facilities in the state.

Population

The target population of the study comprised of all nurses working at UCTH from 2012 to 2015. Statistics from the hospital records show that there were five hundred and sixty-eight (568) nurses, of different cadres working at UCTH, Calabar.

The accessible population of the study comprised of one hundred and ninety one (191) nurses working in ten (10) wards that were conveniently selected. These included: Male and Female Medical wards, Male and Female Surgical wards, Male and Female Orthopaedic wards, paediatric medical and surgical wards, Labour ward and Ear, Nose and Throat Ward. 100% of the accessible population of nurses was purposefully used since they met the inclusion criteria. Exclusion criteria include newly qualified nurses who

have not practiced for up to six months after graduation, nurses just posted to UCTH who have not spent up to three months into their posting.

3.4. Research Instrument

A self-developed structured check list was used. Positive comments by psychometric experts were suggestive for the face validity of the instrument. In order to obtain content validity, copies of the checklist were given to a panel of experts in the field of nursing who rated the questions. A Content of Validity Index (CVI) score of 0.08 was obtained. This was considered high enough for the study.

A measure of stability over time was assessed using a test retest procedure which yielded reliability coefficient of 0.81 after an interval of two weeks.

3.5. Data Analysis.

Generated data was analyzed using descriptive and inferential statistics.

3.6. Ethical Protocol.

An official permission was obtained from the Research and Ethics Committee of UCTH Calabar to undertake the study. Also an informed consent was obtained from all the participants of the study. The subjects were chosen according to the criteria and the questionnaires were administered by the researchers to respondents after their consent to participate in the study. The purpose of the study was explained to all the participants and their consent was obtained. They were assured of strict confidentiality and anonymity.

4. RESULTS AND DISCUSSION
 4.1. Socio-demographic data n=191

Table 1: Socio-demographic Data of the Respondents

Variables	Frequency	Percentage (%)
Age in year:		
20 – 24yrs	08	4.2
25 – 29	18	9.4
30 – 34yrs	27	14.1
35 – 39yrs	37	19.4
40 – 44yrs	36	18.9
45 – 49yrs	39	20.4
50 & above	26	13.6
Total	191	100
Gender:		
Male	4	2.1
Female	187	97.9
Total	191	100
Marital status:		
Married	112	58.6
Single	64	33.5
Separated	6	3.1
Widow/widower	9	4.7
Total	191	100
Religion:		
Christianity	185	96.9
Islam	-	-
Traditional Religion	6	3.1
Total	191	100
Professional Rank:		
CNO	17	8.9
ACNO	31	16.2
PNO	24	12.6
SNO	30	15.7
NO I	48	25.1
NO II	41	21.5
Total	191	100
Years of working experience		
1 – 5 years	38	19.9
6 – 10 years	26	13.2
11 – 15 years	41	21.5
16 – 20 years	33	17.3
21 – 25 years	29	15.2
26 – 30 years	16	8.4
31 years & above	8	4.2
Total	191	100

The result of socio-demographic data of respondents presented in Table 1 showed that 114(58.7.2%) of the respondents were between the ages of 30-49 years. Majority, 187 (97.9%). 112 were married 64 were single while 6 were widows representing (58.6%, 33.5% and 3.1%) respectively. 185 (96.9%), were Christians while 6 (3.1%) were traditional worshippers. For professional rank majority 89(46.6) were between NO1and NO11, 31 (16.2%) were ACNO, while 24 (12.6%) were PNOs and the least 17(8.9) were CNOs. 41 (21.5) had 11-15 years of working experience, 64(33.1) had worked for 1-10

years, 78 (30.9) had worked between 16-30years only 8(4.2%) had worked for more than 31years

4.2 Results for Research Objectives

Research Question one

What is the level of nurses' knowledge of injection safety at the University of Calabar Teaching Hospital, Calabar? Descriptive statistics was used for data analysis. The result of this analysis is presented in Figure 1.

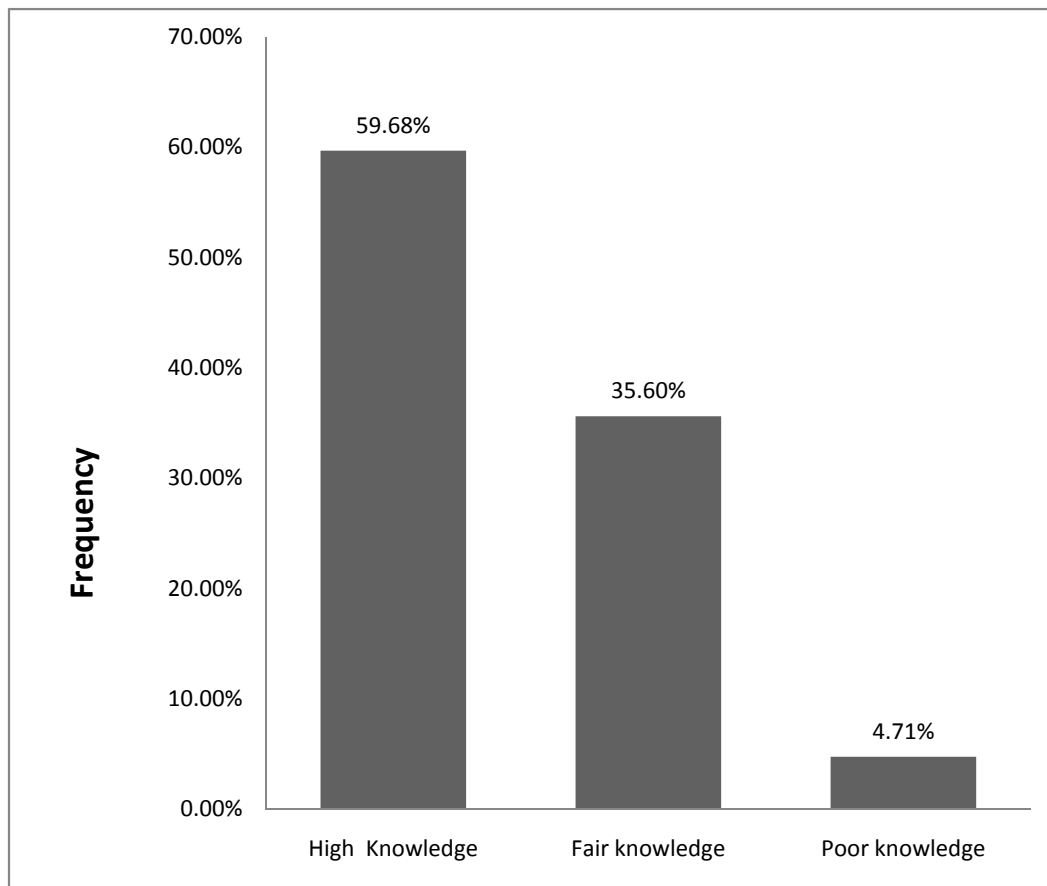


Fig. 1: Bar chart showing nurses' level of knowledge on injection safety

Figure 1 revealed that 114 (59.7%) of the respondents had high knowledge, 68 (35.6%) respondents had fair knowledge, while 9 (4.7%) of nurses had poor knowledge of injection safety in the University of Calabar Teaching Hospital, Calabar.

Research Question 2

What is the level of practice of injection safety among nurses at University of Calabar Teaching Hospital (UCTH). Descriptive statistics was used for data analysis. The result is presented in Figure 2.

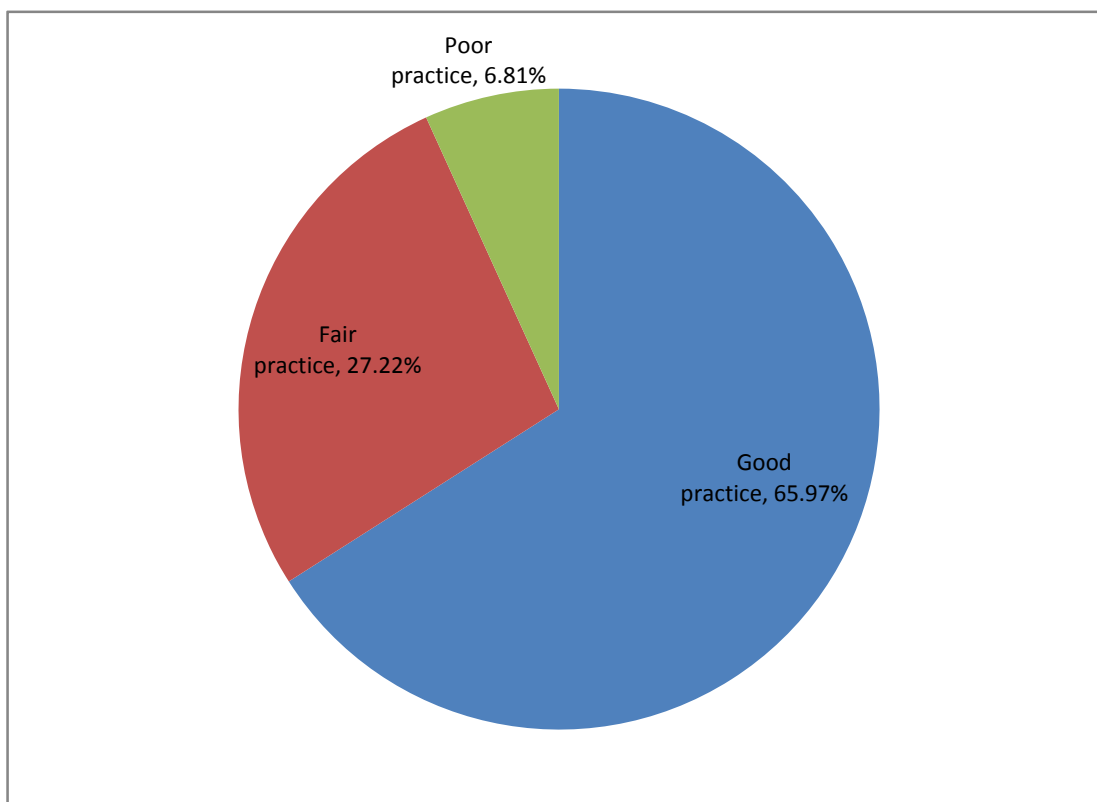


Figure 2: Pie chart showing the level of practice of injection safety among nurses in UCTH

The result of analysis presented in Figure 2 showed that 126 (65.9%) of the respondents (nurses) had good practice of injection safety, 52 (27.2%) of the respondents fairly practiced injection safety, while 13 (6.8%) had poor practice of injection safety at the University of Calabar Teaching Hospital, Calabar..

Research Question 3

What are the barriers to injection safety practice among nurses in University of Calabar Teaching Hospital, Calabar? Descriptive statistics was used for data analysis. The result of this analysis is presented in Table 2.

Table 2: Barriers to Injection Safety Practices among Nurses at UCTH, Calabar.

Barrier variables	Responses				Total
	Yes	%	No	%	
None display of injection safety guidelines makes it difficult to comply with the guidelines.	134	70.2	57	29.8	191
Inadequate supply injection safety material and resources contributes to nurses poor adherence to injection safety practices.	143	74.9	48	25.1	191
Lack of training and retraining is a hindrance to safe injection practices	76	39.8	115	60.2	191
Emergency nature of some cases and work pressure prevent nurses from practicing injection safety.	82	42.9	109	57.1	191
Injection safety practices are not implemented due to shortage of nurses.	12	6.3	179	93.7	191
Nurses' lack of adequate knowledge is a major barrier to injection safety practices.	34	17.8	157	82.2	191

Results in Table 2 revealed that none display of safety guidelines 134 (70.2%) and inadequate supply of injection safety material and resources 143 (74.9%) were barriers to the practice of injection safety, while lack of adequate training and retraining 76 (39.8%), emergency nature of some cases 82 (42.9%), shortage of manpower 12 (6.3%) and lack of adequate knowledge 34 (17.8%) did not constitute any significant barrier to the practice of injection safety

4.3. Results for Research Hypothesis

Hypothesis

There is no significant relationship between knowledge and practice of injection safety among nurses at University of Calabar Teaching Hospital (UCTH), Calabar. The hypothesis was tested using the chi-square (X^2) analysis. The result is presented in Table 3.

Table 3: Chi-square (X^2) analysis of relationship between knowledge and Practice of injection safety among nurses at UCTH

Level of knowledge	Practice			Total	Cal. X^2	Crit. X^2
	Good practice	Fair practice	Poor practice			
High knowledge	65	28	6	99	112.8	9.5
Fair knowledge	21	33	13	67		
Poor knowledge	3	6	16	25		
Total	89	67	35	191		

$P < 0.05$; $df = 4$; Cal $X^2 = 112.8$; Crit $X^2 = 9.5$;

Among the 99 respondents with high knowledge of injection safety, 65 had good practice of injection safety, 28 had fair practice while 6 had poor practice. Out of the 67 respondents who had fair knowledge of injection safety, 21 had good practice, 33 had fair practice, while 13 had poor practice. Among the 25 respondents who had poor knowledge of injection safety, 3 had good practice, 6 had fair practice, while 16 had poor practice.

The result of Chi-square analysis revealed that a calculated value of 112.8, which is higher than the critical value of 9.5 at $p < 0.05$ and 4 degrees of freedom, was obtained. The result is significant, showing a significant relationship between knowledge and practice of injection safety among nurses.

DISCUSSION

This section is focused on discussion of the findings that emanated from this study.

The findings of the study revealed that majority (59.7%) of the respondents had high knowledge of injection safety practices, with the knowledge that safe injection neither harm the recipient nor expose the provider to any available risk; diseases such as HIV/AIDS, Hepatitis B, C and other blood born infections can be transmitted through unsafe injection; and that sharp and non-sharp should be discarded into one place for final burning. However, as large as 35.6% of the respondents were found to have just a fair knowledge of injection safety, while a handful of 4.7% had poor knowledge. These findings correspond with that of Onyemocho, Joshua and Enokela (2013) who reported in a similar study found that majority (54.3%) of nurses had good knowledge of injection safety issues, while 16.7% and 29.0% had fair and poor knowledge respectively. Similarly, the result agrees with the findings of Adejumo and Dada (2013), whose

comparative study on knowledge, attitude, and practice of injection safety among nurses revealed that 70.4% had good knowledge about safe injection practice. However, these findings are contrary to that of Omorogbe, Omuemu and Isara (2012) on injection safety practices among nursing staff of mission hospitals in Benin City, Nigeria, which revealed that knowledge of injection safety was poor among nurses in mission hospitals in Benin City

It is important to state here that Knowledge of injection safety practices among nurses can never be overemphasized because even a 1% lack of knowledge puts patients and the health community at risk. This argument becomes very vital when considering the transmission of blood borne infections as well as other injuries given that even previous studies record high rates of poor knowledge. Therefore, it is the duty of every health care employer to provide adequate training and retraining for staff on injection safety as well as universal safety precautions at large, in order to safeguard the health of health care workers, patients and the nation in general.

With regards to the practice of injection safety among nurses, the findings of this study revealed that majority, 126 (66.0%) of the respondents had good practice of injection safety, with most of them not discarding used syringe in a single unit, using only retractable needles and syringes, practicing hand washing before and after administration of injection and discarding sharps into injection safety boxes. 52 (27.2%) of the respondents fairly practiced injection safety, while 13 (6.8%) had poor practice of injection safety. The result corresponds with that of Paul et al (2011), and Onyemocho, Joshua and Enokela (2013). This result is encouraging because it attests to the fact that nurses are willing and indeed making efforts to ensure safety in their practice. And consistency will

greatly reduce the rate of morbidity and mortality associated with unsafe practices. However, the number of nurses who had fair and poor knowledge of injection safety in this study and could not practice injection safety still constitute risk of contracting blood borne infections and other health hazards gotten from poor injection safety. This calls for need to review and upgrade the nursing education and training in the area of injection safety.

This study further revealed that the barriers to injection safety practices were: None display of injection safety guidelines, inadequate supply of injection safety material and resources; this corresponds with the findings of Sudesh, et al, (2013), Okwen, et al, (2011), Onyemocho et al, (2013) and Gadzama et al (2014) who documented that non-compliance with safe injection practices in health facilities was due lack of availability of equipment and resources for proper disposal, and none availability of injection safety guidelines. It should be appreciated that displayed guidelines will constantly remind practitioners and stimulate them to comply with safety practices. Also the issue of lack of resources cannot be overemphasized. Without resources compliance is very impossible. However, despite the above barriers nurses were knowledgeable and practiced injection safety in higher percentage. This could be associated with the knowledge acquired in school and continuous education programmes, associated with the consciousness to practice.

Emergency nature of some cases, work pressure; shortage of nurses; and nurses' lack of adequate knowledge on injection safety practices did not constitute barriers. Though these results are contrary to expectations, the findings are pointers that barriers were mostly institutional and not from the nurses themselves. The findings agree with Onyemocho, et al, (2013), who reported that the reasons for neglect to adhere to injection safety practice, was poor economic and lack of political will to provide resources in the healthcare system.

The study further revealed a significant positive relationship between level of knowledge and practice of injection among nurses. Implying that the higher the level of knowledge the higher the practice of injection safety and vice versa. The finding agrees with Onyemocho, Joshua and Enokola (2013), whose study revealed a statistical significance relationship between knowledge and practice of injection safety in relation to cadre of staff.

However, of the 99 respondents with high knowledge, 28 and 6 had fair and poor practice respectively. While of the 67 with fair Knowledge, 21 respondents had good practice, whereas 3 and 6 of the 25 respondents with poor knowledge had good and fair practices respectively. These findings imply that knowledge about a thing does not translate to practice of that thing. (Adejumo and Dada 2013). Also the above gaps in knowledge and practice call for concern and the need for hospitals to create enabling environment for total compliance by health care workers and nurses in particular.

CONCLUSION

The findings of the study revealed that knowledge and practice of injection safety among nurses in UCTH, Calabar was good. Implying that the nurses are willing to adhere to safety practices despite the lack of enabling environment, this is highly commendable. However the percentage of those with fair and poor knowledge calls for concern. This implies that some nurses are still unaware that practicing injection safety helps to prevent occupational hazard and the spread of infectious diseases such as HIV/AIDS, Hepatitis B, C and other blood born infections, which can be transmitted through unsafe injection. The good practice of injection safety was as a result of good knowledge and perhaps positive work attitude of some nurses which is also highly commendable.

Implication for nursing Education

This study has revealed that increase in knowledge promotes good practice of injection safety and vice versa. The findings also revealed some nurses had poor knowledge of injection safety practices, still some knowledgeable nurses could not practice injection safety. This implies that nurses' knowledge and practice of injection safety can be improved by nurse educators by intensifying their teachings on injection safety and blood borne infections to further improve on undergraduate/nursing students consciousness while the clinical instructors follow up to ensure practice.

RECOMMENDATIONS

Based on the findings of the study it was recommended that:

1. Clinical instructors should collaborate with nurse and hospital administrators to encourage and ensure display of guidelines of universal precaution and supply injection safety material/resources.
2. Available logistics and support supervision should be put in place to ensure that health workers adhere to standard guidelines and practices.
3. Support and counselling services be provided for staff that reported sharp injuries,
4. Nursing Services, Continuing Education and Infection Control Unit in the hospital and diseases organise more seminars, stressing on the importance of injection safety.
5. Nurses should continue to practice injection safety in order to prevent occupational hazard and the spread of infectious diseases that could be transmitted through unsafe injection practices.
6. Regular workshops and seminars are organized for nurses by Continuous education unit in collaboration with the hospital administration to continue to educate them, especially newly recruited nurses on the need to always adhere to and comply with injection safety guidelines.

REFERENCES

- Adejumo, P. O and Dada, F. A., 2013. A comparative study on knowledge, attitude, and practice of injection safety among nurses in two hospitals in Ibadan, Nigeria. *International Journal of Infection Control*; 9, (1): 34-38 retrieved from <http://www.ijic.info/article/view/10092>.
- Amoran, O. E and Onwube, O., 2013. Infection control and practice of standard precautions among healthcare workers in northern Nigeria. *J Global Infect Dis [serial online]* [cited 2016 Feb 23]; 5:156-63. Available from: <http://www.igid.org/text.asp?2013/5/4/156/122010>
- Chan, R., Molassiootis, A., Chan, E., Chan, V., Ho, B and Lai CY, et al., 2002. Nurses' knowledge of and compliance with universal precaution in an acute care hospital. *Int J Nurs Stud*; 39:157-63.
- Enwere, O. O and Diwe, K. C., 2014. Knowledge, perception and practice of injection safety and healthcare waste management among teaching hospital staff in south east Nigeria: An intervention study. *The Pan African Medical Journal*; 17, (9): 218-223.
- Gadzama, G. B., Bawa, S. B., Ajinoma, Z., Saidu, M and Umar, A. S., 2014. Injection safety practices in a main referral hospital in north-eastern Nigeria; *J Public Health Epidemiol* 17, (2): 134-139.
- Okwen, M. P., Ngem, B. Y., Alomba, F. A., Capo, M. V., Reid, S. R and Ewang, E. C., 2011. Uncovering high rates of unsafe injection equipment reuse in rural Cameroon: Validation of a survey instrument that probes for specific misconceptions. *Harm Reduction Journal* 2011; 8, (4): 4-8.
- Omorogbe, V. E., Omuemu, V. O and Isara, A. R., 2012. Injection safety practices among nursing staff of mission hospitals in Benin City, Nigeria. *Ann Afr Med*; 11, (1): 36-41.
- Onyemocho, A., Joshua, I. A and Enokela, O. P., 2013. Knowledge and practice of injection safety among nurses of Nigerian Prison Service Health Facilities in Kaduna State." *American Journal of Public Health Research* 1, (7): 171-176.
- Paul, B., Roy, S., Chattopadhyay, D., Bisoi, S., Misra, R., Bhattacharya, N and Biswas, B., 2011. A Study on Safe Injection Practices of Nursing Personnel in a Tertiary Care Hospital of Kolkata, West Bengal, India; 10, (6): 681-686.
- Riaz, H, Kamal, S. W., Riaz, T., Aziz, S., Rajper, J and Noorulain, W., 2012. Methods of disposal of used syringes by hepatitis B and C patients at an urban and rural setting. *Journal of PakistanMedAsso*
- Rhode, K. A., Dupler, A. E., Postma, J and Sanders, A., 2013. Minimizing nurses' risks for needle stick injuries in the hospital setting. *Workplace Health & Safety*. 61, (5): 197-202.
- Sridhar, M. R., Boopathi, S., Lodha, R and Kabra, S. K., 2004. Standard precautions and post exposure prophylaxis for preventing infection. *Indian J Paediatric* 71:617-25.
- Sudesh, G., Devendra, S. R., Bhuvan, K. C and Shankar, P. R., 2013. Knowledge and practice regarding injection safety among nurses working in primary health care centre in Baglung district, western Nepal *BMC International Health and Human Rights*; 13, (3): 33-36.
- Yang, Y. H., W. U., S. J and Wang, C. L., 2013. Incidence of needle stick and other sharp object injuries among nurses, *American Journal of Infection Control*, 41, (10): 944-945.
- World Health Organization., 2002. Injection safety fact sheets. http://who.int/injection_safety/toolbox/en/InjectionFactSheet2002.pdf (accessed 18 Dec. 2015)
- World Health Organization., 2011. Question & Answers, Safety of injections. http://who.int/injection_safety/about/resources/en/QuestionAndAnswersInjectionSafety.pdf (accessed 18 Dec. 2015)